



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/399,510	09/20/1999	KIMBLE DONG	384938007US	2349

25096 7590 02/26/2004

PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER

MISLEH, JUSTIN P

ART UNIT	PAPER NUMBER
----------	--------------

2612

DATE MAILED: 02/26/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/399,510

Applicant(s)

DONG ET AL.

Examiner

Justin P Misleh

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 10 is/are rejected.
- 7) ☒ Claim(s) 7 - 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 September 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the Examiner on form PTO-892, they have not been considered.

More specifically, US Patent No. 4,187,519 was listed in the specification on page 2 (lines 12) and is not listed in the Information Disclosure Statement (Paper No. 4, 10 January 2000).

Claim Objections

2. **Claims 7 and 8** are objected to because of the following informalities: antecedent basis problems.

3. Each claim recites, therein, "the processed pixel signals", however, the claim language requires processing image signals. The Examiner cannot assume a relationship between processing image signals and the processed pixel signals. For the purposes of examination, the Examiner will interpret image signals and pixels signals to be the same.

Appropriate correction is required.

4. **Claim 9** is objected to because of the following informalities: dependency issue.

Art Unit: 2612

5. The claim language recites in the preamble, "The image processor of Claim 8", however, neither Claim 7 or Claim 8 introduce an image processor, rather, both Claims require an image sensor. For the purposes of examination, the Examiner will interpret the preamble of Claim 9 as, "The image sensor of Claim 8".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 1, 2, and 4 – 10** are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al.

8. For **Claim 1**, Kim et al. disclose, as shown in figure 2 and as stated in columns 3 (lines 7 – 67), 4 (lines 1 – 10), and 5 (lines 1 – 26), a method for auto black expansion in an image sensor (CCD 100), comprising:

(a) comparing (performed in the Digital Comparator – 230) the voltage level of processed (CDS/AGC – 200 and A/D Converter – 210 process the signals by performing correlated double sampling and analog to digital conversion) pixel signals with a first set voltage level (voltage level B from the microcomputer);

Art Unit: 2612

(b) maintaining a first count of a number of pixels signals that are above or below the first set voltage level (Up/Down Counter – 240 raises and or lowers a running count depending upon whether the pixels signals are greater than or less than the first set voltage level; see column 3, lines 65 – 67, and column 4, lines 1 – 4); and

(c) using the count to determine a first digital control signal for adjusting the black level calibration of the processed pixel signals (The Up/Down Counter – 240 and the Digital Comparator – 230 both accept and output digital signals. An n-bit control signal, provided by the Up/Down Counter – 240, is applied to the D/A Converter – 250 so as to provide control for a Black Level Clamp Circuit – 260. The n-bit digital control signal, provided by the Up/Down Converter – 240, is required for adjusting the black level calibration.).

9. As for **Claim 2**, Kim et al. disclose the method Claim 1, wherein the adjustments to the black level calibration are made in between fields of pixels signals.

The Applicant defines, on pages 2 (lines 16), 3 (lines 15 and 16), 4 (line 3), 8 (line 18), 9 (lines 16 and 17), 10 (lines 21 and 22), and 12 (line 1), that a “field of pixel signals” corresponds to an image signal, or rather a “sensed image” or a “scene”. Thus, Kim et al. teach that adjustments to the black level calibration are made on image signals, as stated in column 3 (lines 14 – 18), and thus, are made between fields of pixel signals.

10. As for **Claim 4**, Kim et al. disclose, the method of Claim 1, further comprising comparing (performed in the Digital Comparator – 230) the pixel signals to a second set voltage level (voltage level B from the microcomputer) and maintaining a second count related to the comparison of the pixel signals to the second level (Up/Down Counter – 240 raises and or lowers

Art Unit: 2612

a running count depending upon whether the pixels signals are greater than or less than the first set voltage level; see column 3, lines 65 – 67, and column 4, lines 1 – 4).

As stated in column 5 (lines 5 – 16), once the black level calibration of the processed pixel signals has been adjusted according to the first set voltage level, the resultant pixel signals are fed back to the CDS/AGC circuit (200), wherein the method repeats itself until the first and second set voltage levels (voltage level B), when compared to the processed pixels signals, equals the processed pixel signals, thereby calibrating the black level to predetermined set voltage values. The first and second set voltage levels are always the same voltage level (voltage level B), however, the claim language does not require that the second set voltage level and the first set voltage level be different from one another.

11. As for **Claim 5**, Kim et al. disclose, the method of Claim 4, wherein the second count (provided by Up/Down Counter – 240) is used to determine a second digital control signal for adjusting the amplification of the processed pixel signals.

The Up/Down Counter (240) and the Digital Comparator (230) both accept and output digital signals. An n-bit control signal, provided by the Up/Down Counter (240), is applied to the D/A Converter (250) so as to provide control for a Black Level Clamp Circuit (260), which in turn further provides control to the amplifier circuit (CDS/AGC Circuit – 200). The n-bit digital control signal, provided by the Up/Down Converter – 240, is required for adjusting the black level calibration and amplifying the pixel signals.

12. As for **Claim 6**, Kim et al. disclose, as shown in figure 2, the method of Claim 5, wherein adjustments to the amplification (CDS/AGC Circuit – 200) of the processed pixel signals are

Art Unit: 2612

only made after adjustments to the black level calibration (Black Level Clamp Circuit – 260) have adjusted the pixel signals to a desired voltage level.

The black level of the pixels signals is adjusted prior to amplification. In other words, it is necessary to adjust the black level of the pixels prior to adjusting the amplification of the pixel signals.

13. For **Claim 7** (see objection above), Kim et al. disclose, as shown in figure 2 and as stated in columns 3 (lines 7 – 67), 4 (lines 1 – 10), and 5 (lines 1 – 26), an image sensor (CCD 100) for processing image signals, comprising:

(a) auto black expansion circuitry for adjusting the relative voltage level of the image signal (The Digital Comparator – 230, Up/Down Counter – 240, D/A Converter – 250, Black Level Clamp Circuit – 260, and CDS/AGC Circuit – 200 are all required for adjusting the black level calibration of the image signals);

(b) a black level voltage input (Black Level Calibration Voltage B, first iteration);

(c) a comparator (Digital Comparator – 230, first iteration), the comparator comparing the processed image [pixel] signals (Image Signal A) to the desired black level signal (Black Level Calibration Voltage B, first iteration);

(d) a counter (Up/Down Counter – 240) for maintaining a count related to the comparison performed by the comparator (Up/Down Counter – 240 raises and or lowers a running count depending upon whether the image signal is greater than or less than the Black Level Calibration Voltage B, first iteration; see column 3, lines 65 – 67, and column 4, lines 1 – 4); and

(e) a digital controller (D/A Converter – 250) for utilizing the count maintained by the counter to determine desired adjustments to the auto black expansion circuitry (The Up/Down

Art Unit: 2612

Counter – 240 and the Digital Comparator – 230 both accept and output digital signals. An n-bit control signal, provided by the Up/Down Counter – 240, is applied to the D/A Converter – 250 so as to provide control for a Black Level Clamp Circuit – 260. The n-bit digital control signal, provided by the Up/Down Converter – 240, is required for adjusting the black level calibration).

14. As for **Claim 8** (see objection above), Kim et al. disclose, the image sensor of Claim 7, further comprising a mid-level voltage input (Black Level Calibration Voltage B, second iteration), and a second comparator (Digital Comparator – 230, second iteration) for comparing the processed image [pixel] signals to the mid-level voltage input.

As stated in column 5 (lines 5 – 16), once the black level calibration of the processed image signal has been adjusted according to the black level voltage input (Black Level Calibration Voltage B, first iteration), the resultant image signal is fed back to the CDS/AGC circuit (200), wherein the process repeats itself until the voltage levels (Black Level Calibration Voltage B, first and second iterations), when compared to the processed image signal, equals the processed image signal, thereby calibrating the black level to predetermined set voltage values.

15. As for **Claim 9** (see objection above), Kim et al. disclose, the image sensor [processed] of Claim 8, further comprising automatic gain control circuitry (200), wherein the digital controller (250) utilizes the count of the second counter to determine adjustments to the automatic gain control circuitry (200).

The Up/Down Counter (240) and the Digital Comparator (230) both accept and output digital signals. An n-bit control signal, provided by the Up/Down Counter (240), is applied to the D/A Converter (250) so as to provide control for a Black Level Clamp Circuit (260), which in turn further provides control to the amplifier circuit (CDS/AGC Circuit – 200). The n-bit

Art Unit: 2612

digital control signal, provided by the Up/Down Converter – 240, is required for adjusting the black level calibration and amplifying the image signal.

16. As for **Claim 10**, Kim et al., disclose, the image sensor of Claim 7, wherein the adjustments to the auto black expansion circuitry are made in between field of pixel signals.

The Applicant defines, on pages 2 (lines 16), 3 (lines 15 and 16), 4 (line 3), 8 (line 18), 9 (lines 16 and 17), 10 (lines 21 and 22), and 12(line 1), that a “field of pixel signals” corresponds to an image signal, or rather a “sensed image” or a “scene”. Thus, Kim et al. teach that adjustments to the black level calibration are made on image signals, as stated in column 3 (lines 14 – 18), and thus, are made between fields of pixel signals.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al.

19. As for **Claim 3**, Kim et al. disclose, the method of Claim 1, wherein the digital control signal comprises n-bits.

Kim et al. teach that the control signal is an n-bit digital control signal, as stated in column 4 (line 9). Kim et al. in no way limit the number of bits included in the digital control signal, and hence, Kim et al. do not specifically disclose an 8-bit digital control signal.

However, an 8-bit control signal is commonly known and used in the art and, thus, at the time

Art Unit: 2612

the invention was made one with ordinary skill in the art would have been motivated to and it would have been obvious for Kim et al. to have used an 8-bit control signal.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art also introduces apparatuses and associated methods for black level calibration that is performed prior to gain adjustments.


Art Unit: 2612

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 703.305.8090. The Examiner can normally be reached on Monday through Thursday from 7:30 AM to 5:30 PM and on alternating Fridays from 7:30 AM to 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Wendy R Garber can be reached on 703.305.4929. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
FEBRUARY 23, 2004


WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600